REMARKS

Claims 1-7, 10, 11, 21-24, 27-30, 52, 63, 64 and 69 were subject to examination in the Non-Final Action ("Action") dated August 10, 2005. New claims 70, 71, 72, 73, and 74 have been added. The amendments to the claims and the issues raised in the Action will be addressed below.

I. Interview Summary.

Applicants wish to express their appreciation to Examiner Bausch and Primary Examiner Sitton for the time and courtesy extended towards Applicants' representative, Karen Magri during the telephonic interview on December 2, 2005. During the interview the unpredictability and lack of a reasonable expectation of success with regard to the use of AFLP methodology in poinsettia was discussed. No agreement was reached.

II. Amendments to the Claims.

Claims 70, 71, 72, 73, and 74 have been added. Support for these new claims can be found throughout the specification and claims as originally filed. No new matter has been added with the addition of these claims.

Claim 70 is similar to claim 1 except that it recites "cultivar-linked amplified polymorphic restriction fragments." This claim is supported by claim 1 as originally filed and by the application at page 3, lines 20-24 and page 4, lines 7-24.

Claim 71 is similar to claim 3 except that it recites "cultivar-linked amplified polymorphic restriction fragments." This claim is supported by claim 3 as originally filed and by the application at page 3, line 20-24 and page 4, lines 14-16.

Claim 72 is similar to claim 21 except that it recites "cultivar-linked amplified polymorphic restriction fragments." This claim is supported by claim 21 as originally filed and by the application at page 3, line 20-24.

Claim 73 is similar to claim 63 except that it recites "wherein the fingerprint comprises a set of cultivar-linked amplified polymorphic restriction fragments." This claim is supported by claim 63 as originally filed and by the application at page 3, line 20-24.

Claim 74 is similar to claim 69 except that it recites "wherein the fingerprint comprises a set of cultivar-linked amplified polymorphic restriction fragments." This claim is supported by claim 69 as originally filed and by the application at page 3, line 20-24.

III. Legal Standard for *Prima Facie* case of Obviousness.

To establish a *prima facie* case of obviousness, the USPTO must satisfy three requirements. First, the prior art reference or combination of references must teach or suggest all of the limitations of the claims. *See In re Wilson,* 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art"), *see also Princeton Biochemicals, Inc., v. Beckman Coulter, Inc.*, 411 F.3d 1332, 1337 (Fed. Cir. 2005). Furthermore, the teachings must come from the prior art, not from the Appellant's disclosure. *See In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991).

Second, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some teaching or suggestion that would have motivated the skilled artisan to modify a reference or to combine references. *Iron Grip Barbell Co., Inc., v. USA Sports, Inc.,* 392 F.3d 1317, 1320 (Fed. Cir. 2004), (*see also In re Fine*, 837 F.2d 1071, 1075 (Fed.Cir.1988) (teachings of a reference can be combined only if there is some suggestion or incentive to do so) (emphasis in the original). Such a requirement prevents a hindsight-based obviousness analysis based on the inventor's disclosure. *Ecolochem Inc., v. So.Cal. Edison Co.* 227 F3d 1361, 1371-72 (Fed. Cir. 2000). In addition, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. §2143.01, citing *In re Mills*, 916 F.2d 680, 682 (Fed. Cir. 1990).

As emphasized by the Court of Appeals for the Federal Circuit, to support combining references, evidence of a suggestion, teaching, or motivation to combine must be ***clear and particular*** and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In*

re Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999), *see also In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000) (there must be particular evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed).

The third requirement to establish a *prima facie* case of obviousness is that the proposed modification or combination of the prior art must have a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *See Amgen, Inc. v. Chugai Pharm. Co.*, 927 F2d 1200, 1209 (Fed. Cir. 1991); *see also In re Vaeck,* 947 F.2d 488, 493 (Fed. Cir. 1991).

Applicants respectfully submit that a prima facie case of obviousness has not been established with regard to the combination of the presently cited references Ling et al. in view of Loh et al, Barcaccia et al., Sukhwinder et al. or Barker et al. as defined by Dice or Tulloss. No clear and particular evidence has been presented from the prior art that provides any motivation to combine. Further, no evidence has been presented from the prior art that one of ordinary skill in the art at the time the invention was made would have considered the proposed combination to have any reasonable expectation of success. Thus, the outstanding rejections fail to satisfy the Office's burden necessary to maintain an obviousness rejection. Accordingly, the present invention is nonobvious over Ling et al. in view of Loh et al, Barcaccia et al., Sukhwinder et al. or Barker et al. as defined by Dice or Tulloss, alone or in any combination, and thus, the rejections based on them should be withdrawn.

IV. Taxonomic Relatedness of Poinsettia, Rice, *Caladium*, *Pelargonium* and Willow.

It is relevant to consider how far removed poinsettia is to the plants used in the studies in the cited references when considering unpredictability of the application of AFLP analysis to any particular plant. The taxonomic relationships of the plants, poinsettia, willow, rice, *Pelargonium,* and *Caladium* are presented in Appendix A and are discussed in detail in the Supplemental Declaration by Dr. Moyer under 37 C.F.R. § 1.132 (enclosed herewith).

As can be seen, two out of the four plants from the cited publications are not even in the same taxonomic Class as poinsettia, that of the dicots. (Supplemental Moyer Declaration, para. 4) Of the plants that are dicots, willow and geranium, only geranium falls into the same Subclass, *Rosidae,* as poinsettia, and after that poinsettia and geranium are completely divergent. *Id.* at para. 7 and 8. Just considering the *Rosidae* subclass, one finds that it is incredibly diverse, containing within it the apple, legume, carrot and dogwood families, in addition to the geranium family to which *Pelargonium* belongs and the spurge family (*Euphorbiaceae*) to which poinsettia belongs. *Id.* at para. 8. As Dr. Moyer states in his Supplemental Declaration, paragraph 8, even within the single genus Euphorbia, of which poinsettia is a member, there is such incredible diversity that one of skill in the art would not generalize findings with one member to that of another member, much less generalize findings with one plant to another that is even more distantly related.

One of skill in the art would be well aware of the distant relationship between poinsettia and the referenced plants, willow, rice, *Caladium,* and *Pelargonium.* As such, the work aimed at willow, rice, *Caladium,* and *Pelargonium,* as disclosed in the cited references would have provided absolutely no motivation to one of skill in the art with respect to the present invention. Therefore, one of skill in the art would not have found the Applicants' achievement in poinsettia obvious in light of results in such distantly related plants, alone or in any combination. In sum, the cited references by Barker et al., Sukhwinder, Loh et al., and Barcaccia et al. do not suggest application of AFLP analysis to poinsettia to one of ordinary skill in the art. None of these references teach or suggest that their findings could be applied broadly to other plants, much less to poinsettia in particular. Nor do they suggest that if tried, the ordinary person of skill in the art would have had a reasonable expectation of success.

V. Claims 1, 3, 5-7, 21, 23-24, 30, 63 and 69 are Patentable over Ling et al. in view of Loh et al. as Defined by Dice.

The Action states that claims 1, 3, 5-7, 21, 23-24, 30, 63 and 69 are allegedly unpatentable under 35 U.S.C. §103(a) for obviousness over Ling et al. in view of the

newly cited reference Loh et al. (*Annals of Botany* 84:155-61, 1999) as further defined by Dice. Action, page 3. According to the Action "Ling et al. teaches a method of distinguishing genetic relationship and diversity between Poinsettia cultivars, including breeding family 'Freedom'." Action, page 3. The Action also states that "Loh et al. teach a method using AFLP marker protocol to identify and study intra-and inter-specific variations in *Caladium bicolor* cultivars, an ornamental asexual plant," and further, "Loh et al. teach using AFLP markers is useful in differentiating and characterizing cultivars within a Caladium species." Action, page 4. The Action concludes that it would have been "obvious to one of skill in the art at the time the invention was made to improve the method of identifying poinsettia cultivars by RAPD markers as taught by Ling et al. to include the AFLP marker assay as taught by Loh et al." and that the "ordinary artisan would have had a reasonable expectation of success in using AFLP marker assay taught by Loh et al. in the method taught by Ling et al. of Poinsettia cultivar genetic analysis because Loh et al. teach using AFLP marker to identify inter- and intra-cultivars in *C. bicolors*, an ornamental asexual plant, like that of Poinsettia cultivars....." Action, page 4-5. Applicants respectfully disagree with this rejection.

As Applicants have previously addressed at some length, the Ling et al. reference does not disclose or suggest a method of estimating a genetic relationship between poinsettia plants, a method of determining the profile similarity between a poinsettia plant and a known poinsettia cultivar, a method of assessing the breeding history of a poinsettia plant, a method of determining whether a poinsettia plant is a representative of a known poinsettia cultivar, or a method of distinguishing a poinsettia cultivar from a known poinsettia cultivar <u>using AFLP analysis</u> as recited by the present claims. As conceded by the outstanding rejection, Ling et al. concerns RAPD analysis. Further, Ling et al. uses RAPD analysis to compare the DNA of poinsettia cultivars from widely differing groups and as a result the RAPD markers used would not have to have been robust to distinguish these cultivars. (*See* prior Moyer Declaration, submitted May 23, 2005, para. 4). Accordingly, Ling et al., alone or in any combination, does not render obvious the present invention utilizing AFLP analysis to distinguish among and between closely related poinsettia cultivars.

The outstanding rejection is based on the premise that Loh et al. provides the motivation for one of ordinary skill in the art to apply AFLP analysis to poinsettia because Loh et al. used this technique to evaluate *Caladium* cultivars. However, there is absolutely no suggestion in the cited Loh et al. publication that AFLP analysis could be applied to poinsettia or even a more general statement that AFLP analysis would be suitable for the study of ornamental plants other than *Caladium*. Loh et al. is solely concerned with *Caladium* and the applicability of AFLPs to *Caladium* cultivars. Further, *Caladium* is a monocot. It is entirely unrelated to the poinsettia, a dicot. As discussed above and in the Moyer Supplemental Declaration, paragraph 9, one of ordinary skill in the art would not have considered results in distantly related plants, such as *Caladium* is to poinsettia, to be applicable to one another.

Additionally, contrary to the assertion in the Office Action, *Caladium* is not an asexual ornamental plant but rather new cultivars of *Caladium* are developed by hybridization. *See* Loh et al. page 155, first paragraph. *Caladium* is asexually reproduced for the purpose of propagation of the various cultivars for commercial sale, but sexual reproduction is used to develop new cultivars. *Id.* A hybrid is defined as "offspring of two parents that differ in one or more heritable characteristics; offspring of two different varieties or of two different species (*see* Raven et al., *Biology of Plants*, Worth Pub., N.Y., N.Y. (1992), page 747 (copy of page 747 enclosed herewith). Hybridization leads to much greater genetic diversity than does asexual reproduction and thus, as a result of hybridization, each new *Caladium* cultivar would be relatively genetically diverse as compared to any plant that is reproduced asexually. Genetic variation in poinsettia is achieved by selection of sports or naturally occurring or induced mutations (which are primarily radiation induced mutations) rather than by breeding techniques such as hybridization. As a result, the genetic base of poinsettia is very narrow. One of skill in the art would not have concluded that the methods of Loh et al. would have had a reasonable expectation of success if applied to an asexually reproduced and thus, much less genetically diverse plant, such as poinsettia.

Prior to the studies described in the present application, it would not have been at all obvious that AFLP fingerprinting analysis could be successfully applied to poinsettia (*see* prior Moyer Declaration, para. 5, submitted May 23, 2005). There were some reports of AFLP analysis in other ornamental plants, but it was uncertain from these studies whether there would be sufficient inter-cultivar diversity among poinsettias that would be detectable by AFLPs (*Id.* at para. 5, submitted May 23, 2005). Thus, one of ordinary skill in the art could not have had any reasonable expectation of success prior to the present invention that sufficient polymorphisms detectable by AFLP would exist among poinsettia cultivars (*Id.* at para. 6).

This lack of an expectation of success is further emphasized by Dr. Moyer's research using microsatellite simple sequence repeat (SSR) analysis with poinsettia. This research and its outcome were reported in Dr. Moyer's previous Declaration (submitted May 23, 2005, para. 8-13). Dr. Moyer found that SSR analysis failed to differentiate poinsettia cultivars. *Id.* at para. 12-14. SSR analysis should have worked as well or even better than AFLP analysis since SSR markers tend to have a higher level of heterozygosity and a generally greater level of somatic stability than AFLP markers. *Id.* at para.13. SSR analysis has been shown to be applicable to a variety of plant species with success in determining genetic relationships. *See* Pejic et al., Theor. Appl. Genet. 97:1248-1255 (1998) and Russell et al., Theor. Appl. Genet. 95:714-722 (1997). Thus, if one argues, as in the outstanding Office Action, that one of ordinary skill in the art would have had a reasonable expectation of success using AFLP analysis on poinsettia based on prior art using the AFLP method with other plant species, then one would also have to agree that one of ordinary skill in the art would have a reasonable expectation of success using SSR analysis in poinsettia. However, as shown in Dr. Moyer's data, the approach using SSR analysis failed in poinsettia. From his data, it appears that the narrow genetic base of poinsettia lacks polymorphisms in the SSR loci. (*see* prior Moyer Declaration, submitted May 23, 2005, para. 13) Thus, with this result in mind, it would be clear to one of ordinary skill in the art that poinsettia was unpredictable regarding the use of such technologies as SSR, RFLP, RAPD, AFLP, etc. to distinguish between and among cultivars. Accordingly, success using such

technologies in poinsettia would be uncertain and that each would need to be tried out empirically.

The uncertainty of the applicability of the AFLP method to poinsettia, or for that matter any particular plant species, is further supported by Mitchell et al. (N. Zealand J. Crop Hort. Sci. 29:77-83 (2001); *see* page 78, first full paragraph) (copy enclosed) wherein it was stated that "[T]he main question we addressed was: can *Magnolia* cultivars be distinguished using AFLP markers?" This statement clearly illustrates the uncertainty and skepticism concerning the application of such technology for distinguishing cultivars of any particular plant. Further, in Mitchell et al. cultivars of the plant of interest, *Magnolia*, are hybrids. See, Mitchell et al. pages 77-78. Thus, even with an inherently greater level of genetic diversity as compared to poinsettia, these researchers preface their report with the uncertainty concerning the general applicability of AFLP technology that was prevalent even after filing date of the present invention. Additionally, even though Mitchell et al. concluded that the AFLP methodology could be applied successfully to distinguish *Magnolia* cultivars, there were unexplained anomalies that may indicate, in fact, that this method may not rigorously distinguish between cultivars of *Magnolia*. (*see*, Mitchell et al., page 82, first full paragraph).

As discussed above, the Court of Appeals for the Federal Circuit has held that "[b]oth the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." *In re Dow Chemical*, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). Furthermore, what is required under 35 U.S.C. § 103 is an "as a whole" assessment of the invention which further requires a showing that an artisan of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the prior art and combined them in the claimed manner. *Ruiz v A.B. Chance Co.*, 357 F3d 1270, 1275 (Fed. Cir. 2004), see also *Princeton Biochemicals, Inc., v. Beckman Coulter, Inc.*, 411 F.3d 1332, 1337 (Fed Cir. 2005). These criteria are not satisfied by the outstanding obviousness rejection. Simply identifying all of the elements in a claim in the prior art does not render a claim obvious. *Ruiz v A.B. Chance Co.*, 357 F3d 1270, 1275.

At most, the combination of the Ling et al., Loh et al. and Dice would have made it obvious to try to apply AFLPs to poinsettia cultivars. However, "obvious to try" is not the legal standard for obviousness under section 103. In the absence of any suggestion or demonstration whatsoever in any of the cited references that AFLP analysis would be appropriate for the study of poinsettias and given the lack of any close relationship between poinsettia and the plants studied in the cited references, there could have been no reasonable expectation of success with respect to the present invention. Thus, the teachings of Ling et al. in view of Loh et al. as defined by Dice would have provided neither the motivation to combine nor a reasonable expectation of success to one of ordinary skill in the art with respect to the present invention, both of which are legally required to maintain the outstanding rejection.

In view of the foregoing, Applicants respectfully submit that the claimed subject matter is nonobvious over Ling et al. in view of Loh et al. as defined by Dice, and that the outstanding rejection cannot be maintained. Accordingly, Applicants request that the outstanding rejection under §103(a) be withdrawn.

VI. Claims 1, 3, 5-7, 21, 23-24, 30, 63 and 69 are Patentable over Ling et al. in view of Barcaccia et al. as Defined by Dice.

The Action has maintained the rejection of claims 1, 3, 5-7, 21, 23-24, 30, 63 and 69 as unpatentable under §103(a) over Ling et al. in view of Barcaccia et al. as defined by Dice. The Ling et al. reference has been addressed above and in the prior response and prior Moyer Declaration, submitted May 23, 2005. The deficiencies of Ling et al. are not remedied by the teachings in Barcaccia et al. concerning *Pelargonium* or the analytical methods of Dice. The AFLP work in *Pelargonium* reported by Barcaccia et al. is not relevant to poinsettias, and would not have provided the motivation or reasonable expectation of success with respect to the claimed invention that are legally required to maintain the present rejection.

As a preliminary matter, as discussed above and in Dr. Moyer's Supplemental Declaration, paragraph 8, *Pelargonium* or geranium is taxonomically unrelated to poinsettia. They are in entirely different taxonomic Orders, poinsettia in the *Euphorbiales* and geranium in *Geraniales*. *Id.* In the *Euphorbiales* alone the diversity

of the plants represented is enormous much less when one starts comparing plants inside the *Euphorbiales* to those outside, such as the *Geraniales*. *Id.* One of ordinary skill in the art would have recognized the enormous differences between geranium and poinsettia and would not have found the application of AFLP analysis to geranium to teach, suggest, or motivate one to apply AFLP analysis to the poinsettia. *Id.* at para. 8-9. Further, even if tried, the work with AFLPs and geranium would have failed to provide to one of ordinary skill in the art a reasonable expectation of success in its application to poinsettia, due to the recognition of the very distant relationship between the two species. *Id.*

Additionally, it should be noted that the data in Barcaccia et al. is generated using a very small number (10) of geranium plants of entirely unknown genetic origin. The only information they have about these plants is phenotypic, which appears to divide 9 of the plants into two populations; the very same populations that the AFLP analysis detects. The 10th plant was a decayed flower from which no certain phenotypic data could be gotten and this fell into a third AFLP grouping. Barcaccia et al. present no evidence that any of these plants represented different cultivar populations at all. There is simply no information as to the genetic similarity or dissimilarity of the plants used. Without any information on the genetic background of the plants used for the analysis, one of ordinary skill in the art would not have concluded based on Barcaccia et al. that AFLP analysis was successful in distinguishing even geranium cultivars, much less that the same technique could be applied successfully to distinguish between and among poinsettia cultivars. At most, one could say that this group of 10 geraniums fell into three apparent groupings but since nothing is known about the plants nothing can be said for the ability of the technique to distinguish geranium cultivars.

The Action states on page 10, lines 17-18, that: "However, neither the rejections or the claims are comparing the gene pools of poinsettia and geraniums." Applicants wish to clarify the previous arguments. The outstanding rejection draws a direct connection between work in geranium and the present invention in poinsettia. The rejection is based on the premise that there would have been motivation to combine work done in geranium (Barcaccia et al.) with work done in poinsettia (Ling et al.), and,

further, that the use of AFLP analysis in geranium would render obvious the use of AFLP analysis in poinsettia (this is the same premise upon which every obviousness rejection in the outstanding Office Action is based). Applicants' previous arguments regarding the distinctness of geranium and poinsettia are directed to the legally deficient foundation of the outstanding rejection; because there is no genetic relationship between geranium and poinsettia, (1) there would be no motivation to combine the cited references, and (2) even if the references were so combined there would not have been any reasonable expectation of success with respect to the present invention. Accordingly, the outstanding rejection over Ling et al. in view of Barcaccia et al. and Dice is legally insufficient to establish a *prima facie* case of obviousness and should be withdrawn.

At page 11, lines 10-13, the Action states that:

> The response has been thoroughly reviewed but not found persuasive because Barcaccia et al teach the use of AFLP to recognize polymorphisms found in geraniums that are genetically uniform with more than 4000 cultivars that have been created by controlled mating (sporting) or mutations, as Moyer et al teaches with poinettia's.

Applicants wish to point out that nowhere does Moyer et al. state that "controlled matings" are used in the development of poinsettia cultivars as are used in the development of geranium cultivars. In the prior Moyer Declaration, submitted May 23, 2005, para. 6, Dr. Moyer states that most poinsettia cultivars are identified by selection of sports or induced mutations. The suggestion in the Office Action that "sports" are equivalent to controlled matings is incorrect. Sports are defined as "a sudden deviation from type: a mutation." The Concise Oxford Dictionary of Botany, ed. M. Allaby, Oxford University Press, p. 387 (1992) (copy of page enclosed). Controlled matings are crosses between different plants in which both parent plants are known and specifically selected. Controlled matings, in contrast to sport selection, increase genetic diversity in a population. Further, Barcaccia et al. states that the geranium cultivar populations "to an increasing extent are commercial hybrids." *See* page 243, 2nd col., first para. As a result of the controlled matings and hybridizations, one of ordinary skill in the art would expect the genetic diversity in geranium to be much greater than that of poinsettia, which has a narrow genetic base (*see* prior Moyer Declaration, submitted May 23,

2005, para. 15.) and would not consider the ability to distinguish poinsettia cultivars to be obvious in light of Barcaccia' s AFLP analysis of 10 genetically unidentified geranium plants.

At page 12, lines 1-4, the Action states that:

> The response asserts that on page 10, 2nd full paragraph, at most the combination of Ling et al., Barcaccia et al. and Dice reference would have made it obvious to try to apply AFLPs to poinsettia cultivars. Therefore, applicant is disclosing that the method of Ling in view of Barcaccia and Dice anticipates the claimed invention.

Applicants wish to point out for the record that they in no way concede that the claimed invention is anticipated by or rendered obvious by the cited references. Applicants were merely pointing out that even if, for the sake of argument, the references made it obvious to try the present invention, a *prima facie* case of obviousness cannot be based on obviousness to try and, again, the present rejection cannot be sustained.

Further, at the bottom of page 12 (lines 15-20), the Action states that:

> The response asserts that the microsatellite clearly show that you must detect the "right" marker and unexpectedly the inventors have determined the SSR markers are not useful indicators of poinsettia cultivar identity and relationship. This response has been thoroughly reviewed but not found persuasive because the claims are not drawn to a method of identifying poinsettias by using SSR or microsatellites. The claims are drawn to methods of identifying poinsettias by AFLP.

Again, Applicants wish to clarify their previous argument so that the Examiner can reconsider the Moyer Declaration submitted May 23, 2005. SSR /microsatellite analysis is generally considered to be very powerful. Following the reasoning reflected in the outstanding rejections, one would assume that using SSR/microsatellite analysis to determine genetic relationships in poinsettia would be "obvious." In fact, SSR/microsatellite analysis was not able to reliably detect genetic relationships in poinsettia. These results point to the great unpredictability in applying techniques such as RAPD, AFLP, SSR to poinsettia and emphasize the faulty reasoning underlying the outstanding rejections. Thus, Applicants again assert that one must detect the "right" markers; and, further, that it could not have been obvious to one of ordinary skill in the art at the time of invention that AFLP would, in fact, detect the "right" markers.

Finally, on page 13 (lines 5-11), the Action states that:

> Furthermore, Barcaccia et al. teach using AFLP markers to identify the genetic relationship (identity vs. diversity) (breeding history) between a found flower and another plant (see page 244, 1st column, 2nd full paragraph). Therefore, Barcaccia et al. teach using AFLP markers to identify the breeding history of a plant (the found flower to a known plant). Therefore, Barcaccia et al. teach using AFLP markers to evaluate the breeding history of an asexual plant.

Applicants' respectfully note that Barcaccia's forensic work in comparing a found geranium flower with another geranium plant did not "evaluate the breeding history" of the plant as recited by claim 3 and claim 71. Evaluation of the breeding history refers to methods that provide information regarding the **pedigree** of the plant, for example, whether a plant is "essentially derived" from another plant or whether the reference plant was otherwise part of the pedigree of the new plant. One of the unexpected discoveries of the inventors was that the presently claimed invention can be used to evaluate breeding history. None of the cited references give any inkling whatsoever that AFLP analysis, or any other genetic analysis technique, can be used to evaluate breeding history in any plant, much less poinsettia as presently claimed.

In light of the discussion above, it is therefore respectfully requested that the obviousness rejection over Ling et al. in view of Barcaccia et al. as defined by Dice be withdrawn.

VII. Claims 1, 3, 5-7, 21, 23-24, 30, 63 and 69 are Patentable over Ling et al. in view of Sukhwinder et al. as Defined by Dice.

The Final Action has maintained the rejection of claims 1, 3, 5-7, 21, 23-24, 30, 63 and 69 as unpatentable under §103(a) over Ling et al. in view of Sukhwinder et al. as defined by Dice. The Ling et al. reference has been addressed in detail above and in the prior Moyer Declaration, submitted May 23, 2005. The deficiencies of Ling et al. are not remedied by the teachings in Sukhwinder et al. concerning rice or the analytical methods of Dice. The AFLP work in rice reported by Sukhwinder et al. is not relevant to poinsettias, and would not have provided the motivation to combine or reasonable expectation of success with respect to the claimed invention that are legally sufficient to maintain the present rejection. As discussed above and

in the Supplemental Declaration by Dr. Moyer, paragraph 5, rice is entirely unrelated taxonomically to poinsettia. They are not even in the same taxonomic Class, as rice is a monocot and poinsettia is a dicot. (Supplemental Moyer Declaration, para. 4) One of ordinary skill in the art would not consider results in such distantly related plants, such as rice is to poinsettia, to be applicable to one another. *Id.* at para. 9.

Additionally, in view of the unpredictability of genetic fingerprinting in poinsettia (discussed in detail above on page 15, last two lines through page 17, first full paragraph and in the prior Moyer Declaration, para. 15, submitted May 23, 2005), the use of AFLPs in poinsettias would not have been at all obvious to one of ordinary skill in the art based on Ling in view of Sukhwinder's work and further in view of the methods of Dice prior to the present invention.

In light of the discussion above, it is therefore respectfully requested that the obviousness rejection over Ling et al. in view of Sukhwinder et al. as defined by Dice be withdrawn.

VIII. Claims 1, 3, 5-7, 21, 23-24, 30, 63 and 69 are Patentable over Ling et al. in view of Barker et al. as Defined by Tulloss.

The Action has also maintained the rejection of claims 1, 3, 5-7, 21, 23-24, 30, 63 and 69 as unpatentable under §103(a) over Ling et al. in view of Barker et al. as defined by Tulloss. The Ling et al. reference has been addressed in the preceding sections of this response and in the prior Moyer Declaration, submitted May 23, 2005. The discussions in Barker et al. regarding willow and/or the analytical methods of Tulloss et al. do not remedy the deficiencies of the Ling et al. reference. Again, the AFLP work in willow reported by Barker et al. is not relevant to poinsettias, and would not provide the requisite motivation or reasonable expectation of success with respect to the present invention. Willow trees are unrelated taxonomically to poinsettia. (Supplemental Moyer Declaration, para. 7) They are in entirely different taxonomic Subclasses, willow in the *Dilleniidae* subclass and poinsettia in the *Rosidae* subclass. *Id.* at para. 7-8. One of ordinary skill in the art would not consider results in such distantly related plants, such as willow tree is to a poinsettia plant, to be applicable to one another. *Id.* at para. 9.

Additionally, in view of the unpredictability of genetic fingerprinting in poinsettia (discussed in detail above on page 15, last two lines through page 17, first full paragraph and in the prior Moyer Declaration, para. 15, submitted May 23, 2005), the use of AFLPs in poinsettias could not have been at all obvious to one of ordinary skill in the art based on Ling in view of Barker's work and further in view of the methods of Tulloss prior to the present invention.

Accordingly, it is submitted that the present invention is patentable over Ling et al. in view of Barker et al. as defined by Tulloss, and request that the outstanding rejection under §103(a) on this basis be withdrawn.

IX. New Claims 70-74.

New claims 70-74 recite "cultivar-linked" amplified polymorphic restriction fragments. These new claims are patentable over the prior art for all of the reasons discussed above. In addition, Applicants have found that cultivar-linked polymorphisms related to cultivar identity can be used to enhance the robustness of the claimed methods (*see* Application, page 3, lines 20-30). Applicants discovered that surprisingly for an asexual plant, poinsettia exhibits a high level of intracultivar variability (*see* Application, Example 2, pages 24-25 and Example 3, page 25). The significance of intracultivar variability in poinsettia was not previously appreciated in the art, and the success of the present invention is attributable, at least in part, to the identification of cultivar-linked polymorphisms. None of the cited references taken alone or in combination, have distinguished between markers related to intracultivar and intercultivar variability and none have used markers identified as cultivar-linked to determine genetic relationships in any plant. Most certainly, none of the cited references disclose or suggest a method of using cultivar-linked markers to evaluate genetic relationships in poinsettia as presently claimed.

Accordingly, the Applicants respectfully submit that the present invention is patentable over Ling et al. in view of Loh et al, Barcaccia et al., Sukhwinder et al or Barker et al. as defined by Dice or Tulloss and request that the outstanding rejections under §103(a) be withdrawn.

X. Conclusion.

The concerns of the Examiner having been addressed in full, Applicant respectfully requests withdrawal of all outstanding rejections and the issuance of a Notice of Allowance forthwith. The Examiner is encouraged to address any questions regarding the foregoing to the undersigned attorney, who may be reached at (919) 854-1400.

Respectfully submitted,

Karen A. Magri
Registration No. 41,965

Enclosures:

Supplemental Rule 132 Declaration of Dr. James W. Moyer (w/appendix)
Park et al.
Porter, page 338
Mitchell et al.
Pejic et al.
Russell et al.
Raven et al., page 747
The Concise Oxford Dictionary of Botany, page 387

Customer No. 20792
Myers Bigel Sibley & Sajovec, P.A.
P. O. Box 37428
Raleigh, North Carolina 27627
Telephone: (919) 854-1400
Facsimile: (919) 854-1401

CERTIFICATE OF EXPRESS MAIL

Express Mail Label Number: EV 769241521 US
Date of Deposit: February 7, 2006
I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Katie Wu